investments that have the same risk. The central conceptual issue identified by the parties to this proceeding is what assumptions to make with respect to competition in assessing the risk Verizon faces.

61. Verizon argues that the Commission must make the same assumptions in calculating cost of capital that it makes in calculating network investment.[193] It states that TELRIC assumes more competition than exists today, and it is therefore inappropriate to assume that Verizon will remain the dominant company in the local market.[194] Verizon also argues that the cost of capital should reflect the increased risk of stranded investment associated with the fact that a competitive LEC can use UNEs on a short-term basis before migrating a customer to the competitive LEC's own facilities.[195]

62. AT&T/WorldCom state that the Commission should look at the existing level of competition in calculating cost of capital.[196] They argue that the Commission is not required to use the same assumptions about competition that it uses to calculate network investment because the *Local Competition First Report and Order* requires a cost of capital based on the actual risks faced by an incumbent LEC, not the risks it would face under TELRIC assumptions.[197] This approach assumes that Verizon will remain the dominant carrier in the market for the foreseeable future.[198] AT&T/WorldCom's economist stated on cross-examination, however, that the assumptions underlying the calculation of cost of capital should be consistent with the assumptions used to calculate network investment.[199]

63. After the record in this case closed, the Commission issued the *Triennial Review Order*. In that order, the Commission addressed the issue disputed here. Specifically, the Commission clarified that a TELRIC-based cost of capital should reflect the same competitive assumptions that are used to determine network investment.[200] Based on this clarification, we agree with Verizon that the cost of capital used in this proceeding must reflect the risks of a market in which Verizon faces facilities-based competition, and that AT&T/WorldCom's

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[193] Verizon Ex. 104 (Vander Weide Direct), at 8.

[194] *Id.* at 8.

[195] *Id.* at 10; *see also* Verizon Ex. 111 (Hausman Rebuttal), at 15-17. Although Dr. Hausman suggests that a mark-up of Verizon's costs is needed to compensate for the failure of the TELRIC methodology to consider sunk costs, the prices proposed by Verizon in this proceeding do not reflect this mark-up, and we will consider only the specific cost of capital proposal made by Dr. Vander Weide.

[196] AT&T/WorldCom Ex. 10 (Hirshleifer Rebuttal), at 6-7.

[197] *Id.* at 4-7.

[198] *Id.* at 7, 19-21.

[199] Tr. at 3201.

[200] *See Triennial Review Order*, paras. 680-82.

assumption that Verizon is, and will remain, the dominant local telephone company cannot form the basis of our cost of capital decisions.

3. Implementation Issues

64. Verizon proposes an overall cost of capital of 12.95 percent[201] and AT&T/WorldCom propose an overall cost of capital of 9.54 percent.[202] In both cases, the overall or weighted average cost of capital (WACC) has three components: (1) cost of debt, (2) cost of equity, and (3) capital structure (*i.e.*, the proportions of debt and equity that the company uses to finance its assets and operations). Although there are only minor differences in the proposed capital structures and costs of debt, there are significant differences in the parties' proposed costs of equity because the parties used different models and different proxy groups. In this order, we will select between the parties' proposals for each of the relevant components, and then calculate a cost of capital based on these selections. Because Verizon's proposed cost of capital of 12.95 percent is closer to the figure we calculate based on these selections, we will use a 12.95 percent cost of capital to calculate UNE rates in this proceeding.[203]

a. Cost of Debt

65. Verizon estimates a 7.55 percent cost of debt using an average yield to maturity analysis of Moody's A-rated industrial bonds for March 2001.[204] Verizon claims that this estimate is conservative because it does not include flotation costs that must be paid to issue debt securities.[205]

66. AT&T/WorldCom state that the best estimate of the cost of debt is the weighted

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[201] Verizon Ex. 104, at 3.

[202] AT&T/WorldCom Ex. 5 (Hirshleifer Direct), at 4.

[203] We note that our decision here is based on the record before us and that applying the same methodology to current data could produce different results. To cite just one example, we note that there has been a significant decline in interest rates since this proceeding started. For example, the 20-year Treasury security yield fell from 5.65 percent in January 2001 to 4.34 percent in June 2003, before rising to 4.92 percent in July 2003. *See* Federal Reserve Statistical Releases, *Selected Interest Rates (H.15) (Government Securities, Federal, Constant Maturity, 20-Year, Monthly)* (visited Aug. 14, 2003) <http.federalreserve.gov/releases/h15/data/m/tcm20y.txt>. The rate on shorter term instruments has fallen even more. For example, the three-month yield during the same period fell from 5.29 in January 2001 to .92 percent in July 2003. *See* Federal Reserve Statistical Releases, *Selected Interest Rates (H.15) (Government Securities, Federal, Constant Maturity, Three-Month, Monthly)* (visited Aug. 14, 2003) <http.federalreserve.gov/releases/h15/data/m/tcm3m.txt>. The rate for AAA corporate bonds also dropped during this same period, from 7.15 percent in January 2001 to 4.97 percent in June 2003, before rising to 5.49 percent in July 2003. *See* Federal Reserve Statistical Releases, *Selected Interest Rates (H.15) (Moody's, Private, AAA Rating, Monthly)* (visited Aug. 14, 2003) <http.federalreserve.gov/releases/h15/data/m/aaa.txt>.

[204] Verizon Ex. 104, at 45.

[205] *Id.*

average cost over all of the subject company's outstanding issues, including the debt of the holding company and any subsidiaries.[206] AT&T/WorldCom estimate a 7.86 percent cost of debt using a yield to maturity analysis of Bell Atlantic and GTE bonds, as listed in Standard & Poor's (S&P) bond guide.[207]

67. We adopt the cost of debt proposed by AT&T/WorldCom. As noted above, the cost of capital calculation is intended to reflect the cost of capital of a telecommunications carrier that operates in a market with facilities-based competition. In this case, Verizon's proposed 7.55 percent is based on a group of companies that generally operate in competitive markets, while AT&T/WorldCom's proposed 7.86 percent is based on an analysis of Bell Atlantic and GTE bonds. We conclude, however, that AT&T/WorldCom's proposal to use the cost of debt for Bell Atlantic and GTE is the better of the two proposals because it at least reflects the cost of companies in the relevant industry.[208] In contrast, Verizon has not demonstrated that the debt costs faced by S&P companies generally are at all related to the costs telecommunications carriers would face in a market with facilities-based competition. Nor are there alternative data in the record that support Verizon's proposal, as we find below with respect to the beta used in calculating the cost of equity.[209]

b. Cost of Equity

(i) CAPM or DCF Model

68. Verizon's cost of equity estimate is based on a constant growth version of the discounted cash flow (DCF) model.[210] The constant growth DCF model holds that a company's cost of equity capital equals the sum of the stock's expected dividend yield and the stock's dividend growth rate, which is assumed to be constant. Verizon estimates the cost of equity capital using this model for a subset of S&P 500 Industrial Firms.[211] Verizon asserts that the S&P Industrials are an appropriate proxy group because they are "a well-known sample of publicly traded competitive companies whose risk, on average, approximates the risk the incumbent LECs actually face in providing telecommunications services in a competitive market."[212]

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206 AT&T/WorldCom Ex. 5, at 9.

207 *Id.*

208 As noted below, the incumbent LEC holding companies operate in a mix of fully competitive businesses (*e.g.*, wireless) and businesses where competition is just emerging (*e.g.*, local telephony). *See infra* para 93.

209 *See infra* paras 91-92.

210 *See* Verizon Ex. 104, at 46.

211 *Id.*

212 *Id.*

69. AT&T/WorldCom estimate the cost of equity capital by averaging estimates derived from the Capital Asset Pricing Model (CAPM) and a three-stage DCF model.[213] The CAPM holds that a company's cost of equity capital equals the expected risk-free rate, plus the product of the expected beta for the common stock and a risk premium reflecting the difference between the expected market rate of return and the expected risk-free rate of return.[214] Beta measures the degree to which a company's stock varies relative to the market as a whole.[215] It represents the systematic or non-diversifiable risk of the stock.[216] AT&T/WorldCom use the CAPM to obtain cost of equity capital estimates for a proxy group of five companies: Verizon, BellSouth, SBC, ALLTEL, and CenturyTel.[217]

70. AT&T/WorldCom apply the three-stage DCF model to Verizon, BellSouth, SBC, and ALLTEL at the holding company-level.[218] They assume that dividends will: (1) increase in the five-year first stage at an annual rate that varies between approximately 11-15 percent, depending on the company; (2) decrease linearly annually in the 15-year second stage until hitting their estimate for the long-term growth rate of the economy; and (3) increase forever in the third stage at the long-term growth rate of the economy.[219]

71. We conclude that the CAPM is the better mechanism for estimating the cost of equity in this proceeding. The CAPM requires three estimates: (1) risk-free rate; (2) risk premium; and (3) beta. Unlike the various DCF models, the CAPM does not rely on assumptions concerning dividend growth rates, and therefore cost of capital estimates derived from the CAPM are no better or worse for companies that are growing rapidly than for those growing slowly.[220]

72. Verizon's only criticism of the CAPM is that the spread between the yield on long-term Treasury bonds and A-rated Industrial and utility bonds has increased since 1998 due to the Treasury's decision at that time to reduce the supply of long-term Treasury bonds, and this has caused CAPM cost of equity results to decline even though telecommunication debt costs

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[213] AT&T/WorldCom Ex. 5, at 10-11.

[214] *See id.* at 21.

[215] *See id.* at 21-22. *See infra* section III(C)(3)(b)(iv) for a detailed discussion of beta.

[216] *See* AT&T/WorldCom Ex. 5, at 21-22.

[217] *Id.*, Attach. JH-9.

[218] *Id.* at 15-19. AT&T/WorldCom did not include CenturyTel in their DCF analysis because it has a small dividend yield and therefore the cost of equity produced with the DCF model is not meaningful. *Id.* at 19 n. 18.

[219] *Id.* at 15-16.

[220] Modern finance textbooks routinely present the CAPM as an accepted method of estimating the cost of equity capital. *See, e.g.*, RICHARD BREALY AND STEWART MEYERS, PRINCIPLES OF CORPORATE FINANCE 164-73 (2d Ed. 1984).

have remained constant.[221] Efficient capital market theory, however, would hold that bond yields on a given day reflect (at least) all publicly available information and that current yields are the best estimate of future yields.[222] Given the passage of time, bond yields during the period of this proceeding should no longer be anomalously low due to the Treasury's announcement; any lingering effect of the announcement is not an anomaly and is reflected in the CAPM analysis. In addition, as discussed below, we consider both short-term and long-term bonds in developing our cost of equity estimate, which provides a degree of comfort that both estimates are reasonably accurate if they have roughly the same magnitude. We also use the arithmetic average market risk premium calculated over the longest period for which reliable data are available, thereby minimizing the impact of any short-term fluctuation from long-term trend.

73. In contrast to the benefits of using a CAPM analysis, we have identified a number of concerns with each of the DCF analyses presented. For example, the constant growth DCF model advocated by Verizon assumes that dividends will grow at the same rate forever.[223] Typically, regulators have used this type of model to prescribe a cost of capital for utilities.[224] Some utility growth rates years ago may have been relatively stable and roughly the same magnitude as the long-term growth rate of the economy. If the growth rate used in the model is substantially inconsistent with this assumption, however, the finance literature concludes without exception that the model is unlikely to produce an accurate cost of equity capital estimate.[225] Verizon's use of the constant growth DCF model to estimate the cost of equity capital for its S&P proxy group stretches the reasonable limits of its use. AT&T/WorldCom derive an estimate of the long-term economy-wide growth rate of approximately six percent, which is unchallenged by Verizon.[226] For most of its S&P proxy group of firms, Verizon assumes constant growth rates that are higher than AT&T/WorldCom's long-term economy-wide growth estimate. The market value weighted average of the constant growth rates Verizon assumes for its S&P proxy group of firms is approximately 13 percent,[227] a figure that is more than twice AT&T/WorldCom's long-

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[221] *See* Verizon Ex. 112 (Vander Weide Rebuttal), at 59-60.

[222] *See* EDWIN J. ELTON AND MARTIN J. GRUBER, MODERN PORTFOLIO THEORY AND INVESTMENT ANALYSIS 361-405 (3d ed. 1987)

[223] Verizon Ex. 104, at 13-14.

[224] The constant growth DCF model has been widely accepted by regulators for many years. In fact, the Commission derived its current 11.25 percent rate of return prescription using this model. *See Represcribing the Authorized Rate of Return for Interstate Services of Local Exchange Carriers*, CC Docket No. 89-624, Order, 5 FCC Rcd 7507, 7528, para. 178 (1990) ("We have found that RHCs [Regional Holding Companies] are still an appropriate surrogate for LEC interstate access service and that 'classic' DCF estimates for the RHCs should be given the greatest weight in our decision.").

[225] *See* ROGER A. MORIN, REGULATORY FINANCE, UTILITIES' COST OF CAPITAL 111, 123, 143, 156, 231-38 (1994); HAIM LEVY AND MARSHALL SARNAT, CAPITAL INVESTMENT AND FINANCIAL DECISIONS 510-13 (3d ed. 1986).

[226] AT&T/WorldCom Ex. 5, at 17.

[227] Verizon Ex. 104, Attach. A.

term economy-wide growth rate estimate. As AT&T/WorldCom demonstrate, however, no company can grow forever at a greater rate than the economy as a whole,[228] and therefore we conclude that Verizon's assumption is not reasonable.

74. In addition, the results of Verizon's cost of equity capital analysis are inconsistent with its argument regarding the appropriate proxy group. Verizon argues that the S&P Industrial companies are an appropriate proxy group because they operate in fully competitive markets, as opposed to the incumbent LEC parent companies, which, according to Verizon, presently operate in less risky markets than the Commission's TELRIC rules assume.[229] Yet Verizon derives a 14.75 percent cost of equity capital for its S&P 500 proxy companies, and a 15.52 percent cost of equity capital for the four incumbent LEC parent companies in the S&P proxy group, ALLTEL, BellSouth, SBC, and Verizon.[230] As Verizon acknowledges, however, common sense holds that the cost of capital should be high for companies that face high risk and low for companies that face low risk.[231] Consequently, either Verizon is incorrect that the incumbent LEC parent companies face less risk than the S&P Industrial companies, or there is some flaw in its DCF model. Because Verizon's statements regarding the relative risks of incumbent LECs and S&P Industrial companies are consistent with other information in the record (*e.g.*, information on the betas for the various companies),[232] it appears that Verizon's DCF model does not accurately capture the risks faced by different types of companies.

75. AT&T/WorldCom's DCF model has similar flaws. For example, they offer no explanation or evidence supporting the magnitude or the pattern of the growth rate assumptions beyond the fifth year.[233] There are an unlimited number of different growth rate estimates that could be used in such a DCF model. Different growth rate estimates, even among those that might be considered reasonable, could produce significantly different cost of equity capital estimates. The cost of equity capital estimate derived from a three-stage DCF model is only as accurate as the assumptions on which the model relies. There is no basis on which to find that AT&T/WorldCom's three-stage DCF model produces a reasonable cost of equity capital estimate, given the lack of support for their dividend growth rate assumptions.

76. Moreover, like the Verizon DCF model, the AT&T/WorldCom DCF model produces results that are inconsistent with expectations regarding the risks of different types of companies. Verizon states that the AT&T/WorldCom DCF model produces lower cost of equity

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[228] AT&T/WorldCom Ex. 10, at 13.

[229] Verizon Ex. 104, at 40-41, 46.

[230] *Id.* at 47.

[231] Verizon Ex. 118 (Vander Weide Surrebuttal), at 40-41.

[232] *See* Verizon Ex. 192 (Verizon response to record request no. 12 (requested Oct. 25, 2001)).

[233] AT&T/WorldCom Ex. 5, at 16-17.

estimates for high-risk companies than it does for low-risk companies.[234] Specifically, Verizon notes that the AT&T/WorldCom DCF model produces a lower rate for the S&P 500 companies than for LECs, and that the estimates for both of these groups are lower than the cost of equity estimates for electric and gas utilities.[235] Verizon states that there is no rational explanation for these results other than flaws in the DCF model.[236] We agree with Verizon that these results are indicative of flaws in the AT&T/WorldCom DCF model. Based on these factors, we select the CAPM and consider its terms in the following paragraphs.

(ii) Risk-Free Rate of Return

77. The risk-free rate, the first term in the CAPM, is the rate of return an investor could obtain if it faced no risk. AT&T/WorldCom developed two separate CAPM cost of equity capital estimates using as the risk free rate: (1) the expected 30-day Treasury bill rate; and (2) the 20-year Treasury bond rate.[237] The expected 30-day Treasury rate that AT&T/WorldCom use is 4.93 percent,[238] and the 20-year Treasury bond rate that they use is 6.26 percent.[239] Verizon re-stated AT&T/WorldCom's CAPM study using different estimates for beta and the risk premium, but it used AT&T/WorldCom's 20-year Treasury bond estimate for the risk-free rate in that re-statement.[240]

78. The parties have identified some concerns with both the 30-day Treasury bill rate and the 20-year Treasury bond rate. The 30-day Treasury bill rate has almost no default risk and little interest rate risk. It therefore is the closest proxy for a risk-free rate. The 30-day Treasury bill may fluctuate widely, however, resulting in fluctuating and unreliable cost of equity capital estimates. Moreover, the maturity period of the 30-day Treasury bill does not match the long-term horizons of equity investors. Finally, the 30-day Treasury bill will not reflect factors (*e.g.*, inflation) in the same way that a long-term security such as a common stock will.

79. The use of a long-term bond rate as the risk-free rate avoids the problems associated with the use of the 30-day Treasury bill. Long-term Treasury bonds are almost risk free for investors that have long-term investment horizons. They are less volatile than 30-day Treasury bills, reflect long-term inflation expectations, and have an investment horizon that matches more closely those of common stock investors than that of the 30-day Treasury bill.

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234 Verizon Ex. 118, at 40-41.

235 *Id.* at 41.

236 *Id.* at 43-47.

237 AT&T/WorldCom Ex. 5, at 26.

238 *Id.* at 33.

239 *Id.*

240 Verizon Ex. 112, at 60.

The only alleged problem with the 20-year Treasury bond was previously identified by Verizon, *i.e.*, that the rate is not representative of the true risk-free rate due to the Treasury's 1998 decision to reduce the supply of long-term bonds.[241] As noted above, we rejected Verizon's argument on this point.[242]

80. Although we conclude that either a short-term or long-term rate could be used, we will adopt AT&T/WorldCom's proposal and estimate the cost of equity capital twice – once using the 4.93 percent expected 30-day Treasury bill rate and once using the 6.26 percent 20-year Treasury bond rate – and then average the results.

(iii) Market Risk Premium

81. The market risk premium component of the CAPM reflects the difference between the expected rate of return for the market as a whole and the expected risk-free rate of return. AT&T/WorldCom use two sources of information to estimate the market risk premium. First, they rely on the difference between Merrill Lynch's expected return on the market and the expected yields on the one-month and the 20-year Treasury securities.[243] Second, AT&T/WorldCom rely on both arithmetic and geometric average historical differences between realized stock market and Treasury security returns over several different time periods.[244] Using these data sources, AT&T/WorldCom derive a market risk premium of 7.5 percentage points for the one-month Treasury bill and 5.5 percentage points for the 20-year Treasury bond.[245]

82. Verizon uses the Ibbotson Associates arithmetic average risk premium for stocks over long-term government bonds for the period 1926-1999, 8.10 percent, to restate AT&T/WorldCom's CAPM study.[246] Verizon argues that AT&T/WorldCom's use of geometric average differences, rather than arithmetic averages, is not defensible, nor is the use of a time period that includes periods prior to 1926.[247]

83. We adopt Verizon's recommended approach of using data from Ibbotson Associates, but we will use two risk premiums, one for the 30-day Treasury bill and one for the 20-year Treasury bond. For the reasons explained above, the market risk premium should be based on the average excess of the market rate of return over the risk-free rate over the longest

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[241] *Id.* at 59-60.

[242] *See supra* para. 72.

[243] AT&T/WorldCom Ex. 5, at 27-29.

[244] *Id.* at 29-32, Attach. JH-8.

[245] *Id.* at 32.

[246] Verizon Ex. 112, at 60.

[247] *Id.* at 52-56.

period for which reliable data are available. Ibbotson Associates publishes risk premiums that are widely used. Verizon uses the Ibbotson Associates arithmetic average risk premium for stocks over long-term government bonds for the period 1926-1999, 8.10 percent, to re-state AT&T/WorldCom's CAPM study.[248] AT&T/WorldCom uses Ibbotson Associates' arithmetic average risk premium for stocks over 30-day Treasury bill returns for the period 1926-1999, 9.45 percent, in one of their CAPM specifications.[249] We also note that AT&T has relied on the Ibbotson Associates historical risk premium for government securities, either in whole or in part, in the CAPM analyses it has undertaken to estimate the cost of capital for evaluating real-world business projects.[250]

84. In addition to the Ibbotson Associates data, AT&T/WorldCom's market risk premium calculation relies in part on Merrill Lynch's expected rate of return to estimate the risk premium, but they do not explain or document how Merrill Lynch derives this number. Accordingly, we give this estimate no weight in developing the correct risk premium to use in a CAPM analysis. AT&T/WorldCom also rely in part on the geometric average historical risk premium to develop the risk premium they use in their CAPM analysis. As Verizon notes, most cost of capital experts agree that the arithmetic historical average, not the geometric historical average risk premium, should be used in the CAPM analysis.[251] In statistical terms, the arithmetic average, not the geometric average, is the unbiased measure of the expected value of repeated observations of a random variable. Use of the geometric average produces a smaller risk premium and a lower cost of capital compared to use of the arithmetic average.

85. AT&T/WorldCom also rely in part on historical data from as far back as 1802.[252] As Verizon notes, however, many cost of capital experts agree that it is appropriate to use the longest period for which reliable return data are available to calculate the risk premium in a CAPM analysis, but that reliable data on stock market returns were not available until approximately 1926.[253] The historical risk premium approach assumes that average realized return is a proxy for expected return. Realized returns may vary substantially from anticipated returns over short periods, but the two coincide over very long periods, such as from 1926-present.[254] Giving weight to shorter periods than 1926-present produces a smaller risk premium

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[248] *Id.* at 60.

[249] AT&T/WorldCom Ex. 5, Attach. JH-8.

[250] Letter from Mark A. Keffer, AT&T Chief Regulatory Counsel, Atlantic Region, to Magalie R. Salas, Secretary, FCC, CC Docket Nos. 00-218, 00-251, at response no. 6 (requested Oct. 24, 2001) (filed Dec. 12, 2001) (Keffer Dec. 12 Letter).

[251] Verizon Ex. 112, at 54-58.

[252] AT&T/WorldCom Ex. 5, Attach. JH-8

[253] Verizon Ex. 112, at 57-58.

[254] *See* MORIN, *supra* note 225, at 313-14.

and a lower cost of capital compared to use of the longer period.

86. Based on our decision to use two risk-free rates of return, it follows that we must use two market risk premiums. Specifically, we will use the 9.45 percent risk premium together with the 4.93 percent expected 30-day Treasury bill rate, and the 8.10 percent risk premium together with the 6.26 percent 20-year Treasury bond. Using the beta selected below, we will calculate two costs of equity, which we will average to obtain a final result.

(iv) Beta

87. Beta measures the degree to which a company's stock price varies relative to the market as a whole, *i.e.* it represents the systematic or non-diversifiable risk of the stock.[255] A company has a beta equal to 1.0 if its stock price changes over time to the same degree as stock market prices change in the aggregate. A company that has a beta equal to 1.0 has the same risk as the market. A company has a beta greater than 1.0 if its stock price changes over time to a greater degree than stock market prices change in the aggregate, *i.e.*, if it has greater risk than the market. A company has a beta less than 1.0 if its stock price changes over time to a lesser degree than stock market prices change in the aggregate, *i.e.*, if it has less risk than the market. Selection of a beta is the most difficult aspect of the cost of capital calculation because there is no real-world company that provides UNEs in the type of competitive market assumed under the Commission's TELRIC rules, and therefore no real-world company's beta precisely reflects the risk of participating in such a market.

88. Verizon proposes calculating the cost of equity capital using an S&P 500 proxy group of companies, to reflect the competitive assumptions implicit in the Commission's TELRIC rules.[256] Although Verizon does not advocate using the CAPM, it did restate AT&T's CAPM analysis using Value Line betas for 365 S&P 500 companies.[257] The market value weighted average Value Line beta for these companies is 1.05, while the simple average beta is 1.00.[258] Verizon also placed Value Line betas into the record for BellSouth (.85), SBC (.85), ALLTEL (.75), and CenturyTel (.95).[259] The market value weighted average beta for these companies is .85, and the simple average also is .85.[260] Verizon also placed into the record the

[255] *See* AT&T/WorldCom Ex. 5, at 21-22.

[256] Verizon Ex. 104, at 46-47.

[257] Verizon Ex. 112, at 60. Value Line is an investment advisory service that provides information on betas for public companies.

[258] *See id.* at 60.

[259] *See* Verizon Ex. 192.

[260] *See* Verizon Ex. 112, at 51.

Value Line beta for AT&T, .95.[261]

89. AT&T/WorldCom propose calculating the cost of equity capital using a proxy group of large incumbent LEC holding companies, to reflect the competitive risks an incumbent LEC faces today.[262] They use BARRA betas for BellSouth (.65), Verizon (.68), SBC (.83), ALLTEL (.74), and CenturyTel (.84).[263] The market value weighted average BARRA beta for these companies is .73, while the simple average is .75.[264] These are "levered" betas, which means they have been adjusted to reflect the capital structure used in AT&T/WorldCom's analysis.[265]

90. Although we do not agree with the rationale underlying Verizon's proposal, we conclude that it is reasonable to use Verizon's proposed beta of 1.0 to develop the cost of capital in this proceeding. The businesses of most of Verizon's S&P 500 proxy group of companies have no obvious similarity to the provision of local exchange services, and Verizon did not describe any. Consequently, there is no basis on which to conclude that this proxy group best represents the risks that Verizon would face if it faced facilities-based competition. Nevertheless, the overall beta of 1.0 for the S&P 500 companies for which Verizon placed betas into the record does produce a useful benchmark for the risk faced on average by established companies in competitive markets. Absent evidence of any unique risks associated with the telecommunications industry, or a particular segment of the industry, we would be uncomfortable prescribing a cost of equity capital for UNEs that is based on a beta significantly higher or lower than the average beta for companies that face competition.

91. Moreover, based on the information in the record regarding the betas of interexchange carriers (IXCs), a beta of 1.0 appears to represent a reasonable estimate of the risk faced by a company such as Verizon in a market with facilities-based competition. The long-distance companies for which we have betas (AT&T and (pre-bankruptcy) WorldCom) build, own, operate, and maintain long distance networks.[266] The assets they use, activities they perform, and functions they provide are comparable, but not identical, to incumbent LEC assets, activities, and functions. Moreover, they operate these assets in an environment that clearly is competitive, with a number of ubiquitous facilities-based competitors. Although there are obvious differences between the local exchange market and the interexchange market, the betas

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[261] *See* Verizon Ex. 192.

[262] AT&T/WorldCom Ex. 5, at 40. Indeed, AT&T/WorldCom argue that the current risk of an incumbent LEC holding company overstates the risk associated with providing UNEs. *Id.* at 40-43.

[263] *Id.*, Attach. JH-5. Like Value Line, BARRA is an advisory service that provides information on betas for public companies.

[264] *Id.*

[265] *See id.* at 25.

[266] *See* Verizon Ex. 192; Keffer Dec. 12 Letter, at response no. 6 (beta for WorldCom and MCI is 1.03).

of the IXCs are a relevant proxy group for us to consider in attempting to quantify risk in a TELRIC proceeding.

92. We draw further support for the use of a beta of 1.0 from the evidence regarding the betas used by AT&T in making internal investment decisions. AT&T has used the CAPM to derive the cost of equity capital for evaluating long distance, wireless, and cable TV projects.[267] For these purposes, it used a beta equal to 1.03, based on the weighted average of the betas for WorldCom and MCI developed from a variety of sources.[268]

93. We find AT&T/WorldCom's proposal to use a beta based solely on a proxy group of incumbent LECs unpersuasive in light of some of the important factors not reflected in the incumbent LECs' betas. Their betas may be thought of as a weighted average of the betas for each line of business in which they operate. Although the incumbent LECs' current betas do reflect some risk associated with their participation in competitive markets, such as wireless, those betas likely understate the risk of selling UNEs in a competitive market because the incumbent LECs continue to operate as regulated monopolies or near-monopolies in many of their markets. For example, approximately 58 percent of Verizon's year 2000 consolidated revenues are attributable to operating telephone company regulated services.[269] In contrast, the assumption required under the Commission's TELRIC rules, *i.e.*, that the incumbent LEC faces or potentially faces a ubiquitous competitor that uses only the most efficient technology and network configuration, does not reflect the current local exchange market. The TELRIC cost of capital would have to reflect the risk of participating in such a market.[270]

94. Similarly, the current betas for the incumbent LECs may not reflect the risk that an incumbent LEC will not be able to recover the initial capital outlay for an asset if any anticipated decreases in asset prices over time are not factored into the depreciation allowance. As the Commission found in the *Triennial Review Order*, if equipment prices are declining, an incumbent LEC needs to recover more of its investment in an asset during the early years of the asset's life and less in the later years in order to compete effectively with a subsequent entrant that pays less for the same asset.[271] Even if there is no new entry, but the cost of an asset is continuously decreasing, an incumbent LEC would not recover the initial capital outlay for the asset if regulators at each rate proceeding establish successively lower UNE prices based on the

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[267] Keffer Dec. 12 Letter, at response no. 3.

[268] *Id.*, at response no. 6. The 1.03 beta is a "re-levered" beta, *i.e.*, one that is adjusted to reflect the capital structure that AT&T used in its analysis, 10 percent debt and 90 percent equity, as opposed to the capital structure of WorldCom and MCI. AT&T included a 1 percentage point premium in its cost of capital estimate to "provide a margin of safety." *Id.*, at response no. 3. That is, using a beta of 1.03 in CAPM produced a WACC of 14.31 percent, but AT&T used a cost of capital of 15.31 percent in analyzing investment opportunities.

[269] *See* Verizon Ex. 186 (Verizon response to record request no. 6 (requested Oct. 24, 2001)).

[270] *Triennial Review Order*, paras. 680-82.

[271] *Id.*, para. 690.

application of straight line depreciation to lower asset prices.[272]

95. Beyond the general problems inherent in using incumbent LEC betas to calculate a TELRIC cost of capital, we have additional problems with the specific betas proposed by AT&T/WorldCom. AT&T/WorldCom use beta and risk premium estimates in their CAPM analysis developed by BARRA, a consulting firm.[273] BARRA is not nearly as well known or widely circulated as Value Line, and it is unlikely to have nearly as much influence on the expectations of investors.[274] Value Line perhaps is the largest and most widely circulated investment advisory service, and it exerts influence on a large number of institutions and individual investors and on the expectations of these investors.[275] In making its own capital budgeting decisions, it is noteworthy that AT&T relies in part on Value Line betas, but not at all on BARRA betas.[276] Accordingly, we will not rely on the BARRA betas proposed by AT&T/WorldCom in this case.

(v) Flotation Costs

96. Flotation costs are the costs associated with issuing securities, including underwriters' commissions, legal fees, and printing expenses. Verizon states that these costs, which often are deducted from the proceeds of an offering, typically represent three to five percent of the amount of the proceeds.[277] In addition, Verizon states that there is a decline in stock price associated with the sale of new securities that has been estimated at two to three percent.[278] Verizon believes a five percent flotation cost allowance is a conservative estimate to

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[272] Verizon also argues that a significant portion of local exchange network investment is sunk and irreversible, and that entrants that buy unbundled networks on a month-to-month basis bear none of the risk associated with these investments while the incumbent LEC bears all of it. Verizon Ex. 111, at 9. As a result, according to Verizon, there is a "real options" effect as the competitive LEC receives a risk-free ride on the incumbent LEC's network. *Id.* AT&T/WorldCom disagree completely. AT&T/WorldCom Ex. 20 (Murray Surrebuttal), at 4-33. Given our decision to adopt Verizon's proposed cost of capital, we need not resolve this dispute.

[273] *See* AT&T/WorldCom Ex. 5, at 23-25.

[274] *See* MORIN, *supra* note 225, at 65.

[275] In addition, the BARRA betas are derived by estimating a multiple regression equation specifying that beta is a function of many different independent variables. More typically, beta is measured based on simple regression analysis of changes in a company's stock market price and changes in a broad stock market average price over time. Value Line is among those financial companies that use the simple regression analysis. It also adjusts its betas to account for their long-term tendency to converge to 1, a routine practice among investment services that publish betas. *Id.* at 65, 67-68. Numerous studies have found that betas do regress over time to 1.00. *Id.* at 67-68. This is a compelling reason for using betas that are so adjusted.

[276] Keffer Dec. 12 Letter, at response no. 6.

[277] Verizon Ex. 112, at 47.

[278] *Id.*

include in a DCF model.[279]

97. AT&T/WorldCom did not include a separate flotation cost allowance. AT&T/WorldCom contend that these costs already are anticipated by the market and that including an allowance would provide a double recovery.[280] They also argue that Verizon has in fact issued very little stock in recent years, and is not expected to do so in the foreseeable future, and that, therefore, there is no need to compensate Verizon for flotation costs.[281]

98. Given our conclusion below that the record in this proceeding supports Verizon's proposed cost of capital, we need not resolve the question of whether to include, and how to quantify, flotation costs.

(vi) Cost of Equity Capital Estimate

99. In the CAPM, the overall cost of equity capital equals the expected risk-free rate, plus the product of the expected beta for the common stock and a risk premium reflecting the difference between the expected market rate of return and the expected risk-free rate of return.[282] Based on the analysis above, we will calculate two different cost of equity figures and use the average of the two in developing an overall cost of capital. First, using the 30-day Treasury bill, the cost of equity equals 4.93 + 9.45 (1.0), or 14.38. Second, using the 20-year Treasury bond, the cost of equity equals 6.26 + 8.10 (1.0), or 14.36. We will use the average of the two, 14.37, in developing the overall cost of capital.[283]

c. Capital Structure

100. Verizon recommends a capital structure of 25 percent debt and 75 percent equity, based on a proxy group of S&P Industrials and telephone holding companies over a five-year period.[284] Verizon argues that AT&T/WorldCom's use of a capital structure based on book value is not forward-looking and not consistent with TELRIC.[285]

101. AT&T/WorldCom recommend a capital structure of 34.5 percent debt and 65.5

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[279] *Id.* at 48.

[280] AT&T/WorldCom Ex. 17 (Hirshleifer Surrebuttal), at 37.

[281] *Id.* at 38.

[282] *See* AT&T/WorldCom Ex. 5, at 21.

[283] As discussed in the next section, it will be necessary to use an implied cost of equity of 14.22 percent in running the cost models in this case.

[284] Verizon Ex. 104, at 44-45.

[285] Verizon Ex. 112, at 27-28.

percent equity by using a mid-point WACC estimate.[286] The WACC formula was applied using book and market average weights.[287] AT&T/WorldCom argue that a company with low operational risk can afford the risk associated with more debt in its capital structure, and that Verizon's assumption of less debt is inappropriate given the low risk associated with wholesale provision of network elements.[288]

102. We will use Verizon's proposal as the starting point in determining the appropriate capital structure in this case. In calculating TELRIC prices, the theoretically correct capital structure is based on market values of debt and equity, not book values. In section 252(d)(1) of the Act, Congress specifically prohibited the use of traditional rate-base, rate-of-return ratemaking.[289] The Commission has interpreted this section to require prices based on forward-looking costs, because forward-looking costs best replicate the costs a carrier would face in a market with facilities-based competition.[290] Under the Commission's TELRIC rules, we calculate the investment necessary to build a network using the most efficient technology currently available.[291] The TELRIC rules provide for the recovery of the investment in that efficient network through the use of economic depreciation and they provide for a return on that investment through a risk-adjusted cost of capital.[292] The book value of Verizon's existing network is irrelevant for these purposes. Investors would not earn the return that they require if a cost of capital that is based on book value is applied to the economic value of their assets, given that rational investors value these assets at market value. Thus, the use of a capital structure based on market values, rather than book values, represents a departure from traditional ratemaking, but one that is entirely appropriate under the Act.[293]

103. Verizon proposes use of a 75 percent equity/25 percent debt capital structure, based on 1996-2000 data showing that this ratio was no less than 86 percent for the S&P Industrials and 78 percent for telecommunications companies.[294] AT&T/WorldCom estimate

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[286] AT&T/WorldCom Ex. 5, at 39.

[287] *Id.* at 36-37.

[288] *Id.* at 37.

[289] 47 U.S.C. § 252(d)(1).

[290] *See Local Competition First Report and Order*, 11 FCC Rcd at 15846, para. 679.

[291] 47 C.F.R. § 51.505(b)(1); *Local Competition First Report and Order*, 11 FCC Rcd at 15848-49, para. 685.

[292] 47 C.F.R. § 51.505(b)(2), (3); *Local Competition First Report and Order*, 11 FCC Rcd at 15856, paras. 702-03.

[293] We note that AT&T/WorldCom do not argue that a capital structure based on market value is incorrect as a matter of theory. Rather, they argue that in this case it does not reflect the relevant risk of providing UNEs. *See* AT&T/WorldCom Ex. 5, at 36-37. As we explained above, we think Verizon's assessment of the relevant risk is more consistent with the requirements of TELRIC than is AT&T/WorldCom's.

[294] Verizon Ex. 104, at 44-45.

that this ratio for incumbent LECs, based on book value weights, is 49 percent/51 percent. They determine that this ratio is 80 percent/20 percent based on market value.[295] For the reasons described above, we give no weight to the portion of AT&T/WorldCom's proposal that is based on incumbent LECs' book value capital structure. Based on the data on which the parties estimated their market value-based capital structures, a range of 78-80 percent equity and 20-22 percent debt could be justified. Therefore, as between the two proposals presented in this case, Verizon's 75 percent equity/25 percent debt is the better choice. Using this ratio, however, would create a mismatch with the data we use to calculate the cost of equity because those data assume an 80 percent/20 percent equity/debt ratio.[296] To be consistent, it is necessary for us to depart slightly from baseball arbitration and use an 80 percent/20 percent equity/debt ratio.

d. Overall Cost of Capital

104. In our analysis above, we have selected a 7.86 percent cost of debt, a 14.37 percent cost of equity capital, and a capital structure that is 20 percent debt and 80 percent equity to estimate the cost of capital for UNEs. The WACC under these assumptions is 13.068 percent. Accordingly, as between the two proposals presented in this case, using baseball arbitration we adopt the 12.95 percent overall cost of capital proposed by Verizon to develop UNE rates.[297]

D. Depreciation

1. Overview

105. Depreciation is the mechanism by which the investment in an asset is recovered over the life of the asset. The *Local Competition First Report and Order* contains a limited discussion of depreciation. Specifically, the Commission stated that properly designed depreciation schedules should take into account expected declines in the value of goods.[298] The Commission's rules simply require the use of "economic depreciation."[299] In upholding the TELRIC rules, the Supreme Court found that existing regulatory depreciation rates were an appropriate starting point that could be "adjusted upward if the incumbents demonstrate the need."[300]

106. There are two components of depreciation – the useful life of the asset, and the

[295] AT&T/WorldCom Ex. 5, at 36.

[296] *See supra* paras. 88-89.

[297] To achieve a 12.95 percent overall cost of capital, an implied cost of equity of 14.22 percent should be used in lieu of the 14.37 percent identified above when running the MSM and the Verizon cost models.

[298] *See Local Competition First Report and Order*, 11 FCC Rcd at 15849, para. 686.

[299] 47 C.F.R. § 51.505(b)(3).

[300] *Verizon v. FCC*, 535 U.S. at 519.

rate at which the asset is depreciated over the useful life. In a recent decision addressing the issue of asset lives, the Commission noted that more than twenty states have used FCC regulatory lives in calculating TELRIC-based UNE prices.[301] In the same decision, the Commission expressed some concerns about the use of asset lives used in financial reporting, although it did permit incumbent LECs to seek waivers that would allow them to use financial book lives.[302] That decision did not, however, specifically consider whether FCC regulatory lives or financial book lives are more appropriate for use in a TELRIC calculation. In the *Universal Service* proceeding, the Commission used FCC regulatory lives in running the SM.[303] In its section 271 decisions, the Commission has found both FCC regulatory lives and financial book lives to be consistent with TELRIC principles.[304] Similarly, in the *Triennial Review Order*, the Commission declined to mandate one set of asset lives or the other.[305]

107. As to the timing of recovery over the life of an asset, the *Triennial Review Order* clarifies that, under the Commission's "economic depreciation" requirement, a carrier may accelerate recovery of the initial capital outlay for an asset over its life to reflect any anticipated decline in its value.[306] For example, an approach that accelerates cost recovery based on an index showing that equipment prices are declining over time may be consistent with the requirement to use economic depreciation.[307] Recovering more of the initial capital outlay for the asset in the early years would enable a carrier to recover less in later years, thereby allowing it to compete with carriers that have purchased new, lower-priced equipment in those later years.

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[301] *See 1998 Biennial Review – Review of Depreciation Requirements for Incumbent Local Exchange Carriers*, CC Docket No. 98-137, Report and Order, 15 FCC Rcd 242, 257, para. 33 (1999) (*Biennial Review Depreciation Order*).

[302] *See id.* at 262-63, para. 48 ("We believe that giving incumbent LECs the right to select, for regulatory purposes, any depreciation rate allowed by GAAP [Generally Accepted Accounting Principles] is inappropriate as long as incumbent LECs reserve the right to make claims for regulatory relief based on the increased depreciation that would result from granting them that flexibility."); *id.* at 252-53, para. 25 (establishing waiver requirements).

[303] *See Inputs Order*, 14 FCC Rcd at 20344, para. 426.

[304] *See, e.g., Application by Verizon New England Inc., Bell Atlantic Communications Inc. (d/b/a Verizon Long Distance), NYNEX Long Distance Company (d/b/a Verizon Enterprise Solutions), Verizon Global Networks Inc., and Verizon Select Services Inc., for Authorization To Provide In-Region, InterLATA Services in Rhode Island*, CC Docket No. 01-324, Memorandum Opinion and Order, 17 FCC Rcd 3300, 3317, para. 30 (2002) (FCC lives) (*Rhode Island 271 Order*); *Joint Application by SBC Communications Inc., Southwestern Bell Tel. Co., and Southwestern Bell Communications Services, Inc., d/b/a Southwestern Bell Long Distance for Provision of In-Region, InterLATA Services in Kansas and Oklahoma*, CC Docket No. 00-217, Memorandum Opinion and Order, 16 FCC Rcd 6237, 6274, paras. 76 (2001) (financial lives) (*Kansas/Oklahoma 271 Order*), *aff'd in part, remanded in part sub nom. Sprint Communications Co. v. FCC*, 274 F.3d 549 (D.C. Cir. 2001).

[305] *Triennial Review Order*, para. 688.

[306] *Id.*, para. 690.

[307] *Id.*

2. Background

108. Verizon advocates the use of financial reporting lives based on Generally Accepted Accounting Principles (GAAP).[308] It states that GAAP lives are appropriate for use in a TELRIC model because they are reassessed annually to reflect the true economic life of the assets.[309] Verizon argues that GAAP lives are reasonable because they are comparable to those used by competitive companies, such as IXCs and cable operators,[310] and they are longer than the lives suggested in a study prepared by Technology Futures, Inc. (TFI).[311] Verizon also argues that the use of FCC regulatory lives is not appropriate in the context of UNE pricing because the FCC regulatory lives were determined before the 1996 Act and could not possibly reflect the competitive and technological environment assumed under TELRIC.[312] Verizon argues that competition reduces the life of an incumbent LEC's assets and increases the risk that assets will become obsolete before the full investment is recovered.[313]

109. Verizon asserts that the MSM proposed by AT&T/WorldCom fails to take account of the change in price of capital goods, which is an important element of economic depreciation.[314] For example, Verizon identifies central office switches and fiber optic carrier systems as types of equipment that have experienced declining prices in recent years.[315] According to Verizon, failure to reflect declining prices in the depreciation calculation will result in an understatement of depreciation expense, and TELRIC rates that are too low.[316] Similarly, Verizon states that the periodic revaluation of assets required by TELRIC means that carriers must recover more of their investment in the early years of an asset's life in anticipation of possible price reductions in the next rate proceeding.[317] Although Verizon witness Dr. Hausman suggests that this problem can be addressed by including a mark-up in the MSM to account for

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[308] Verizon Ex. 105 (Lacey Direct), at 3; Verizon Initial Cost Brief at 35.

[309] Verizon Ex. 105, at 4-7; Verizon Initial Cost Brief at 35.

[310] Verizon Ex. 106 (Sovereign Direct), at 12-15; Verizon Initial Cost Brief at 42.

[311] Verizon Ex. 106, at 15-16. Verizon does not rely on this study as the basis for its proposed asset lives. Rather, it refers to the study only in an attempt to demonstrate the reasonableness of its own proposal. Verizon Reply Cost Brief at 22.

[312] Verizon Ex. 114 (Sovereign Rebuttal), at 4; Verizon Initial Cost Brief at 37-39.

[313] Verizon Ex. 106, at 5-7; Verizon Initial Cost Brief at 38-39.

[314] Verizon Ex. 111, at 12-14.

[315] *Id.* at 14-15.

[316] *Id.* at 14.

[317] *Id.* at 16; Tr. at 3173.

economic depreciation of capital goods,[318] Verizon itself does not use such a mark-up in running its cost models or the MSM, nor does it use an accelerated depreciation mechanism that would more accurately reflect the effect of declining equipment prices.

110. In response, AT&T/WorldCom argue that the proposal advanced by Dr. Hausman here is conceptually the same as the proposal he made on behalf of the United States Telephone Association in 1996, which was rejected by the Commission in the *Local Competition First Report and Order*.[319] According to AT&T/WorldCom, its model uses forward-looking asset lives that reflect the technology and competition risks faced by Verizon, and there is no need for any additional mark-up to protect Verizon against the risk of under-recovery.[320]

111. AT&T/WorldCom explain that the regulatory lives reflected in the MSM were forward-looking at the time the Commission adopted them, and the continued growth in incumbent LEC depreciation reserves suggests that those lives are more than adequate to reflect the impact of competition and technology in the current environment.[321] AT&T/WorldCom argue that the intensity of competition does not change the useful life of the asset,[322] and that the ability to provide wholesale service through UNEs actually extends the life of an asset that otherwise might be stranded as a result of facilities-based competition.[323] AT&T/WorldCom state that lives based on GAAP are inappropriate because GAAP is based on the principle of conservatism, which requires accountants to err on the side of using shorter lives (thereby increasing costs) in order to protect investors.[324]

3. Discussion

112. Based on the record before us, we agree with AT&T/WorldCom that FCC regulatory lives should be used for purposes of calculating UNE prices. We adopt one modification to AT&T/WorldCom's proposal, however. Specifically, we will use asset lives at the low end of the "safe harbor" range prescribed by the Commission in 1994 and 1995, and

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[318] Verizon Ex. 111, at 14-15. Hausman also suggests a mark-up is needed to account for the effect of risk and uncertainty on sunk and irreversible investments. *Id.* at 15-17.

[319] AT&T/WorldCom Ex. 20 at 18-19 (citing *Local Competition First Report and Order*, 11 FCC Rcd at 15849, para. 686).

[320] *Id.* at 26-27.

[321] AT&T/WorldCom Ex. 3 (Lee Direct), at 6-8 (explaining how the shift to forward-looking projection lives has resulted in increased depreciation reserves); AT&T/WorldCom Initial Cost Brief at 95-96.

[322] AT&T/WorldCom Initial Cost Brief at 105.

[323] AT&T/WorldCom Ex. 9 (Lee Rebuttal), at 14-15; Tr. at 3362-62.

[324] AT&T/WorldCom Ex. 9, at 4-6; AT&T/WorldCom Initial Cost Brief at 97-101.

modified in 1999,[325] rather than the lives prescribed by the Commission for Verizon in Virginia in 1994. The safe harbor lives represent the Commission's most recent assessment of the forward-looking asset lives for each of the accounts. As explained below, we choose the low end of the safe harbor to be consistent with the competition and technology assumptions required under the Commission's TELRIC rules.

113. We find that AT&T/WorldCom's proposal to use the asset lives prescribed by the Commission for Verizon in 1994 is not the best approach. In certain cases, the asset lives proposed by AT&T/WorldCom are too long to be consistent with the forward-looking principles upon which TELRIC is based. For example, they propose a 17-year life for digital switching equipment. Given that the Commission has allowed incumbent LECs to use a life as short as 12 years under the safe harbor, and as short as 10 years based on specific evidence presented by a carrier,[326] a 17-year life is inconsistent with forward-looking principles. Instead, Verizon should use the 12-year life that is the low end of the FCC safe harbor range.[327]

114. Our determination to use FCC regulatory lives applies only where there is a dispute between the parties as to the appropriate asset life. In cases where the parties agree (*e.g.*, a 30-year life for poles), there is no dispute for us to resolve. Similarly, we will adopt Verizon's proposal with respect to salvage percentages because it was not challenged by AT&T/WorldCom.[328] We note that there is no safe harbor range for buildings. Consequently, we will use the economic life of 46.93 years that the Commission used in the *Inputs Order*.[329] A complete list of the asset lives and salvage percentages to be used in establishing rates in this proceeding is found in Appendix A to this order.

115. We reject Verizon's argument that FCC regulatory lives are not sufficiently forward-looking. The Commission has used forward-looking asset lives for some time in its regulation of incumbent LEC depreciation practices, and the asset lives that we adopt here are the most recent ones prescribed by the Commission. While Verizon asserts generally that technological advances and increased competition justify the use of shorter lives, it provides no

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[325] *See Simplification of the Depreciation Prescription Process*, CC Docket No. 92-296, Second Report and Order, 9 FCC Rcd 3206 (1994); *Simplification of the Depreciation Prescription Process*, CC Docket No. 92-296, Third Report and Order, 10 FCC Rcd 8442 (1995). The Commission modified the range for digital switching in 1999. *See Biennial Review Depreciation Order*, 15 FCC Rcd at 247-48, para. 13.

[326] *See Prescription of Revised Percentages of Depreciation Pursuant to the Communications Act of 1934, As Amended, for GTE North, Inc./GTE South, Inc.*, FCC 99-369, Memorandum Opinion and Order, 15 FCC Rcd 1755 (1999); Verizon Ex. 114, at 9. Although the Commission allowed GTE to use a 10-year life for digital switches, we explain below that Verizon has not provided specific evidence in this proceeding that would justify the use of asset lives outside the safe harbor range.

[327] *See Biennial Review Depreciation Order*, 15 FCC Rcd at 247-48, para. 13.

[328] AT&T/WorldCom Ex. 9, at 2.

[329] *See Inputs Order*, 14 FCC Rcd at 20391, App. A, Part 3 (Capital Costs).

specific evidence to support its position. For example, Verizon provides no studies or other documents explaining the anticipated technological advances that might cause it to retire plant more quickly than anticipated when the safe harbor was established (or modified in the case of digital switching), nor has it effectively rebutted AT&T/WorldCom's argument that new technology can extend the life of assets, as DSL technology has done with copper facilities.[330] Similarly, Verizon provides no evidence to demonstrate how increased competition has affected retirement rates since the asset lives we use were established, or how it might affect future retirement rates.

116. We find that Verizon has not demonstrated that financial book lives are a more appropriate measure of the actual economic life of an asset. Verizon did not document or explain in significant detail the methodologies, studies, or data that it, or its auditor, relied on in developing asset lives, nor did it demonstrate that these lives are in fact compliant with GAAP. As compared to our thorough understanding of the process by which the safe harbor lives were developed, Verizon has given us no real basis on which to conclude that the asset lives it proposes reflect the anticipated economic life of assets in a competitive market.

117. For similar reasons, we find that Verizon's comparison of its proposed lives to the financial book lives used by IXCs and cable operators is unconvincing. Even if we were to accept that the economic life of a LEC's assets is the same as the economic life of the assets of an IXC or a cable operator, we have no information on how those lives were developed and no basis upon which to find that they reflect the best estimate of the anticipated economic life of the assets.

118. Verizon's argument that the TFI study validates its proposal is also unconvincing.[331] As AT&T/WorldCom explain, the TFI study assumes that new technology will result in massive waves of retirements (*e.g.*, replacement of copper cable by fiber-to-the-home facilities). Although TELRIC assumes that the value of an incumbent LEC's network is constrained by the widespread deployment of the most efficient technology currently available, that does not mean it is appropriate to assume massive retirements of copper facilities. Our finding here is entirely consistent with the Commission's most recent analyses of the TFI study.[332] AT&T/WorldCom convincingly demonstrate that past TFI studies have been extremely aggressive in their projections, and that actual incumbent LEC retirements have proceeded at a

[330] AT&T/WorldCom Ex. 9, at 14-15.

[331] Verizon Ex. 106, at 15-16.

[332] *See Biennial Review Depreciation Order*, 15 FCC Rcd at 249, para. 16 ("There is no evidence that the large wave of replacements forecast by TFI, which should result in increased retirements, has begun or is about to begin."); *Inputs Order*, 14 FCC Rcd at 20346, para. 428 ("[C]ommenters assert that technological advances and competition will have the effect of displacing current technologies, but offer no specific evidence that this displacement will occur at greater rates than the forward-looking Commission-authorized depreciation lives take into account.").

much slower pace.[333]

119. We agree with Verizon that, if equipment costs are falling, the effect of using straight-line depreciation in lieu of accelerated depreciation is an under-recovery of depreciation expense in the early years of an asset's life and an over-recovery in the later years.[334] Although the Commission's decision in the *Triennial Review Order* specifically authorizes state commissions to adopt an accelerated depreciation mechanism,[335] in this case neither of the parties to the arbitration proposed a measure of depreciation that uses accelerated depreciation to reflect the changing prices of capital goods over time.[336] Although Verizon witness Dr. Hausman suggests that a mark-up of Verizon's costs might cure this problem,[337] this was not part of Verizon's pricing proposal and Verizon did not provide sufficient information upon which we can assess the validity of the suggested mark-up.

120. Similarly, Verizon has not demonstrated that the use of shorter asset lives is an appropriate substitute for using accelerated depreciation to reflect the effect of declining equipment prices. The fact that switch prices are declining, as Verizon asserts, does not necessarily mean that the projected life of a switch will be shorter than it would be in a market with stable or rising switch prices. Rather, the only conclusion we can draw from the declining prices is that a carrier should be able to recover more of its investment in an asset in the early part of the useful life of the asset.

121. Based on the record before us, we are not able to determine whether, and how much, certain types of equipment prices would be expected to decline going forward,[338] and

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[333] *See* AT&T/WorldCom Ex. 9, at 8-11, Attach. 2.

[334] If, on the other hand, equipment prices are expected to increase going forward, economic depreciation expenses would be lower in the early years of the assets' lives and greater in the later years. A carrier in a competitive market could recover less of the initial capital outlay for such assets in the early years because they would compete in later years against entrants that have purchased new, higher priced assets in those years. The effect of using straight-line depreciation in lieu of *decelerated* depreciation is an over-recovery in the early years of an asset's life and an under-recovery in the later years.

[335] *Triennial Review Order*, para. 690.

[336] The MSM includes an option to use accelerated depreciation, rather than straight-line depreciation, and AT&T/WorldCom used this option in running the MSM. Because the MSM levelizes the amount of capital recovery (*i.e.*, the sum of depreciation and return on investment) so that it is the same each year, the effect of using the accelerated depreciation option is to reduce UNE rates. This difference in UNE prices appears to be a result of the tax consequences of the two different depreciation options. Consequently, because the levelization function in the MSM offsets the increased recovery that would be expected in the early years of the asset, running the MSM with the accelerated depreciation option is not the same as using accelerated depreciation to reflect the effect of declining equipment prices.

[337] Verizon Ex. 111, at 14-15.

[338] Similarly, we are not able to project whether, and how much, some equipment prices might be expected to rise going forward.

therefore we are not able to reflect economic depreciation in the rates we prescribe for Verizon. We do, however, consider the risk of under-recovery caused by the lack of economic depreciation in developing the cost of capital, and therefore our inability to establish economic depreciation rates does not mean the rates established in this proceeding are not compensatory.

E. Annual Cost Factors

1. Background

122. The cost models presented by the parties convert investments into annual operating costs through the use of expense factors, or ACFs. It is through the application of the ACFs to the amount of installed investment that we determine the annual costs (*i.e.*, expenses) of owning and operating the facilities and equipment needed to provide a particular network element.[339]

123. The Commission addressed two types of expenses in the *Inputs Order*: plant-specific expenses and common support services expenses. Plant-specific expenses are the costs related to maintenance of specific kinds of telecommunications plant.[340] In the *Inputs Order*, the Commission decided to calculate input values for plant-specific operations expenses as a percentage of investment, on an account-by-account basis.[341] Common support services expenses include the cost of corporate operations (*e.g.*, legal and human resources), customer service (*e.g.*, marketing and billing), and plant non-specific expenses (*e.g.*, engineering and power).[342] The Commission determined that common support services expenses should be calculated on a per line basis, rather than as a percentage of investment.[343] For both types of expenses, the Commission determined that inputs should be based on nationwide averages, rather than the specific expenses of any individual carrier.[344]

2. Positions of the Parties

a. Verizon

124. Verizon's cost study presents a total of eight proposed ACFs: (1) Depreciation, Return, Interest and Income Taxes; (2) Other Taxes; (3) Network; (4) Wholesale Marketing; (5)

[339] Cost of capital and depreciation are discussed in sections III(C) and III(D). The ACFs used in the cost models also include the cost of capital and depreciation expense. In this section of the order we focus on operating expenses.

[340] *Inputs Order*, 14 FCC Rcd at 20301, para. 341.

[341] *Id.* at 20304, para. 346.

[342] *Id.* at 20318-19, para. 377.

[343] *Id.* at 20321, para. 382.

[344] *Id.* at 20305, 20321, paras. 348, 382.

Other Support; (6) Right-to-Use; (7) Common Overhead; and (8) Gross Revenue Loading.[345] The first six ACFs are expressed as expense-to-investment ratios.[346] Multiplying these ACFs by the TELRIC investment produced by the model will produce an estimate of TELRIC expenses. The Common Overhead ACF, which accounts for the expenses of general administrative activities, such as executive and legal, is expressed as an expense-to-expense ratio and operates as a mark-up of the expenses calculated by the other ACFs.[347] The Gross Revenue Loading ACF, which accounts for the cost of uncollectibles and regulatory assessments, is expressed as an expense-to-gross revenue ratio.[348]

125. Verizon uses expense and investment figures for 1999 as the starting point in calculating ACFs. It uses Virginia-specific data for some ACFs and Verizon-East data for others. Verizon argues that it is inappropriate to use nationwide expense ratios for the purpose of establishing UNE rates. It states that the objective of a UNE cost study is to identify the costs the incumbent LEC would incur, which is markedly different than the objective in the Commission's universal service proceedings, where nationwide ratios were used.[349] In addition, Verizon argues that ratios based on nationwide data fail to reflect legitimate state-specific cost differences.[350]

126. Verizon then makes two adjustments to the numerator of certain ratios (Network, Wholesale Marketing, Other Support, and Common Overhead) in order to convert 1999 expenses to forward-looking expenses. First, Verizon applies productivity and inflation factors to the 1999 expense figures.[351] This adjustment takes place within each of Verizon's cost models, rather than in the development of the ratios themselves.[352] The second forward-looking adjustment Verizon makes to its expenses is to reduce the projected cost of repairing copper facilities by five percent to reflect the improved performance of new copper facilities as compared to existing copper facilities.[353]

127. In addition to adjusting the expense number in the numerator to reflect forward-

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[345] Verizon Ex. 107, at 48-49. We address Verizon's right-to-use expenses in the discussion of switching costs in section V(C)(7).

[346] Verizon Ex. 107, at 49.

[347] *Id.*

[348] *Id.*

[349] Verizon Ex. 108, at 57.

[350] Verizon Initial Cost Brief at 169 n.185.

[351] Verizon Ex. 107, at 62.

[352] Verizon Ex. 122, at 22-23, n.19.

[353] Verizon Ex. 107, at 62-63.

looking expenses, Verizon applies a forward-looking-to-current (FLC) conversion factor to the investment number in the denominator of those same ACFs.[354] The premise underlying Verizon's adjustment of the numerator and denominator to forward-looking numbers is that a ratio based on 1999 numbers may understate Verizon's forward-looking expenses because expenses will not automatically fall in proportion to declines in the amount of investment. Verizon argues, for example, that the transition from one loop technology to another technology that requires a lower investment may not necessarily reduce maintenance expense in proportion to the reduction in investment, and it likely will not reduce administrative expenses (*e.g.*, legal expense) at all.[355] Verizon states that the most appropriate figure to use as the denominator is the TELRIC investment calculated as a result of this proceeding.[356] Since that number is not yet available, Verizon relies on data supplied in the New York Commission's recent UNE docket as the basis for proposing a FLC factor of 80 percent that is applied to embedded 1999 investment.[357]

128. AT&T/WorldCom argue that the adjustments made by Verizon are insufficient to reflect the increased productivity that should be achieved in a forward-looking network. Specifically, AT&T/WorldCom state that Verizon's proposed inflation factor is higher than its proposed productivity factor, which results in forward-looking expenses that are higher than current expenses.[358] AT&T/WorldCom note that Verizon agreed to significantly higher productivity adjustments in the 2002 New York UNE case.[359]

129. AT&T/WorldCom criticize Verizon's FLC factor as a "thinly-veiled attempt to recoup the operating costs of its embedded, inefficient network."[360] AT&T/WorldCom argue that the costs of a forward-looking network should be significantly less than those of Verizon's

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[354] *Id.* at 70-71.

[355] *Id.* at 71.

[356] *Id.* at 74 ("The most accurate calculation of the FLC ratio would require Verizon to compare the total plant investments in the TELRIC filing with the total plant investments in Verizon's accounting records.").

[357] *Id.* at 75 ("This data suggests that a ratio of TELRIC investment to current investment of between 75 percent and 80 percent is a reasonable approximation going forward. Verizon conservatively used an 80 percent ratio in its cost studies.").

[358] Tr. at 3803 (Verizon witness Minion acknowledges that forward-looking expenses in 2003 are higher than in 2001 in Verizon's cost study).

[359] Tr. at 3804 (Verizon proposed a productivity factor of 2 percent above inflation for network-related expenses and 10 percent above inflation for non-network-related expenses); *Proceeding on Motion of the Commission to Examine New York Telephone Company's Rates for Unbundled Network Elements*, Case No. 98-C-1357, Order on Unbundled Network Element Rates at 53 (New York Commission Jan. 28, 2002) (*New York Commission Pricing Decision*).

[360] AT&T/WorldCom Ex. 12, at 81.

existing network.[361] They argue that Verizon has not really adjusted the expense number in the numerator of its ACFs to reflect forward-looking costs, and therefore it is unnecessary to adjust the investment number in the denominator by using the FLC factor. In lieu of Verizon's FLC factor, AT&T/WorldCom propose application of a current-cost-to-book-cost (CC/BC) ratio as a means to convert Verizon's embedded investment to 1999 levels before calculating the expense ratios.[362]

130. AT&T/WorldCom also state that Verizon's proposed five percent adjustment for copper cable repair expense substantially understates the cost savings that can be anticipated with the new facilities reflected in the cost models. They state that a more reasonable, but still conservative, estimate of the savings associated with new metallic facilities is 30 percent for both repair expenses and expenses associated with rearrangement of plant.[363] AT&T/WorldCom base this conclusion on documents provided by Verizon that purportedly show expense reductions in excess of 90 percent when older portions of plant are rehabilitated.[364]

131. Verizon disagrees that the documents in question show that a 90 percent expense reduction is possible, and argues that there is no basis for the 30 percent expense reduction advocated by AT&T/WorldCom.[365] Verizon also argues that no reduction at all should be made for rearrangement expenses, as most of those expenses would not be affected by a switch to new copper facilities, and a higher utilization factor would have to be used to justify elimination of the rest.[366]

b. AT&T/WorldCom

132. AT&T/WorldCom use the MSM to calculate ACFs. For plant-specific expenses, AT&T/WorldCom retain the expense ratios used by the Commission in the SM.[367] These ratios are based on an average of 1997 and 1998 expenses and investment using nationwide data, rather than Verizon-specific data.[368] AT&T/WorldCom rely on the Commission's finding in the universal service proceedings that nationwide values are better predictors of forward-looking cost,[369] and they argue that many expenses will not vary among states or regions.[370]

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361 *Id.* at 81-84.

362 *Id.* at 85-86.

363 *Id.* at 89-92.

364 *Id.* at 91.

365 Verizon Ex. 107, at 34-39.

366 *Id.* at 37-38; Tr. at 3899-90.

367 AT&T/WorldCom Ex. 14 (Pitkin Surrebuttal), at 70; AT&T/WorldCom Initial Cost Brief at 106.

368 *Inputs Order*, 14 FCC Rcd at 20305, para. 347-48.

369 *Id.* at 20309, para. 356.